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DIOPHANTINE ANALYSIS.

127. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

Can there be determined three cube numbers whose sum is the product of two squares?

AVERAGE AND PROBABILITY.

165. Proposed by HENRY HEATON, Atlantic, Iowa.

What is the average length of all straight lines that can be drawn within a given square parallel to one of the diagonals?

166. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

Find the average area intercepted by two non-intersecting chords drawn at random in a given circle.

167. Proposed by R. D. CARMICHAEL, Hartselle, Ala.

A line l is divided into n segments by $n-1$ points taken at random on it; find the mean value of the product of p of the segments, the p segments being taken at random and p being less than n .

GROUP THEORY.

8. Proposed by L. E. DICKSON, Ph. D., The University of Chicago.

In a chess tournament between eight players, there are seven rounds, the eight players being paired in each round, every pair to be matched once and but once in the tournament. List the possible programs different except as to notation, *i. e.*, not transformable into each other by a substitution on eight letters. Give the number of conjugate programs of each representative retained.

MISCELLANEOUS.

149. Proposed by F. P. MATZ, Ph. D., Sc. D., Reading, Pa.

Given $\sin^{-1}u + \sin^{-1}\frac{1}{2}u = \frac{1}{4}\pi$, to find u .